

## **Project Description:**

**Name:** Berry Samurai

**Description:** A copy of the mobile game fruit ninja that uses motion tracking to slice fruits with multiple game modes available.

## **Competitive Analysis:**

Fruit ninja is already a mobile application that users can play with using their fingers. My game will use motion tracking using a phone's flashlight as the cursor. This allows the user to play the game in real life rather than moving their finger across the screen.

## **Structural Plan:**

I plan on using a main class that will import other classes that will deal with camera and fruit classes. The camera will deal tracking and drawing the cursor movement. The fruit class will deal with the splitting, updating, and drawing of the fruits themselves.

## **Algorithmic Plan:**

- The flashlight tracking gets all the contours in the frame and finds the largest one
- There is a fruit splitting algorithm that takes the fruit's coordinates and a line and split the fruit into n pieces based off the line
- There is a fruit updating algorithm that takes the fruits x and y velocity and acceleration in the y direction to constantly update the fruits locations

## **Timeline Plan:**

### **TP1:**

- Basic physics of fruit motion completed
- Initial slicing method introduced
- cursor tracking using OpenCV
- Basic GUI Created

### **TP2:**

- Splitting Fruit method created
- Camera calibration added

- Redo structure of application

### TP3:

- Final Gui added
- Add more fruits
- Add secondary gamemode

## Version Control Plan:

**I will use Google Drive to backup my code**

My Drive > 112 > Version Control ▾

Name ▾	Owner	Last modified	File size
tp0_4/23_2:53PM	me	Apr 23, 2021 me	—
tp0_4/21_6:55PM.py	me	Apr 21, 2021 me	6 KB
tp0_4/21_5:48PM.py	me	Apr 21, 2021 me	5 KB
tp0_4/19_11:59PM.py	me	Apr 21, 2021 me	4 KB
tp0_4/19_8:01PM.py	me	Apr 19, 2021 me	4 KB

## Module List:

- **Modules:**
  - OpenCV
  - Numpy
- **Hardware:**
  - Phone flashlight

## TP2 UPDATES:

- Modes were added to change screens
- Camera input resized to 480p to improve games framerate
  - Changed game background to solid color rather than camera input
- I changed the structure of the code, so everything would be in the same file
  - Still a fruit class but no separate class for camera related tasks
- Special scoring method was added
  - Higher point value for more event cuts
- Scoring GUI was updated so that list of point values for each cut can be seen
  - Also shows multipliers for combos if multiple fruit are cut at once

- Slicing algorithm was updated so that when cut into 2 pieces, fruits fly in direction relative to slicing motion
- Cursor was updated with a small trail effect that follows the center showing the cutting line for the fruits
- PIL module added

### **TP3 UPDATES:**

- Secondary game mode is added
  - Cut as many fruit as possible in 90 seconds with bombs removing from the score
- Indicator added to camera calibration
  - Text turns green when desired range is tuned
- Navigation of program adjusted for new game mode and help screen
- Debugging keys added in game modes 1 and 2 for testing functionality
  - Add to score with up arrow
  - Remove time or lives with down arrow
- Added adjustable font parameter in the program if you would not like to install a new font
- Added a explosion graphic for quarter of a second when a bomb is sliced
- Overall code cleanup so code is more methodized